

## Message Text

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ACTION OES-07

INFO OCT-01 EUR-12 EA-07 IO-13 ISO-00 PM-04 NSC-05

SP-02 SS-15 PA-01 PRS-01 MC-02 EB-07 TRSE-00

USIA-06 FEA-01 ACDA-07 CIAE-00 INR-07 L-03

NSAE-00 NRC-05 DODE-00 /106 W

-----101036Z 111689 /16

P R 101005Z MAY 77

FM AMEMBASSY PARIS

TO SECSTATE WASHDC PRIORITY 2629

INFO ERDA WASHDC PRIORITY

ERDA GERMANTOWN MD PRIORITY

AMEMBASSY OTTAWA

AMEMBASSY TOKYO

AMEMBASSY BONN

AMEMBASSY BRUSSELS

AMEMBASSY ROME

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USMISSION IAEA VIENNA PRIORITY

AMEMBASSY MADRID

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ERDA WASHDC FOR N. SIEVERING

E.O. 11652: N/A

TAGS: TECH, ENRG, FR

SUBJECT: NEWLY PROPOSED FRENCH ENRICHMENT SCHEME

REF: A) PARIS 13433, B) PARIS 13320

1. SUMMARY. THE CEA ADMINISTRATOR HAS PLACED A  
SECRECY VEIL ON TECHNICAL INFORMATION RELATING TO  
THE SUBJECT SCHEME. IT APPEARS THAT HE IS INTERESTED  
IN PROPOSITIONS OF INTERNATIONAL COOPERATION LEADING TO  
THE CONSTRUCTION BY 1979 OF A DEMONSTRATION UNIT OF  
50-200,000 SWU. FRENCH EVALUATIONS INDICATE THEIR  
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PROPOSED SCHEME MAY BE COMPETITIVE IN SMALL TO MEDIUM  
SIZES BUT CONSIDERABLE OPTIMIZATION AND  
COMMERCIALIZATION DESIGN WORK WILL BE NECESSARY.  
INCLUDED IN THIS CABLE IS AN INFORMAL TRANSLATION OF  
A CEA PAPER WHICH, EMBASSY WAS TOLD, WAS TO BE THE  
BASIS OF CEA ADMINISTRATOR GIRAUD'S REMARKS IN  
SALZBURG. END SUMMARY.

2. CEA ADMINISTRATOR GIRAUD HAS PLACED A SECRECY VEIL ON THE SUBJECT SCHEME, AND DISCUSSIONS WITH LOCAL CONTACTS INDICATE IT WILL BE VERY DIFFICULT TO GET TECHNICAL INFORMATION ON IT PRIOR TO ANY DEFINITIVE PROGRESS ON THE INTERNATIONALIZATION OF THIS PROJECT. THE FRENCH HAVE CARRIED OUT SOME ECONOMIC EVALUATIONS, AND THEY BELIEVE THAT THE PROCESS CAN BE COMPETITIVE FOR SMALL- TO MEDIUM-SIZE INSTALLATIONS AS ITS COSTS WOULD BE RELATIVELY INSENSITIVE TO THE SCALE. THE CALCULATIONS WERE BASED ON ENRICHMENT REQUIRED FOR LWRS AND TOOK INTO ACCOUNT THE COST OF THE RELATIVELY LARGE AMOUNT OF URANIUM IMMOBILIZED IN THE PROCESS. REPORTEDLY, FRENCH EXPERTS CONSIDER CURRENT DESIGN DIFFUSION PLANTS TO BE MOST ECONOMICAL AT 9 TO 10 MILLION SWU AND THAT IT WOULD BE VERY DIFFICULT FOR THE NEW PROCESS TO COMPETE WITH THE LARGE PLANTS.

3. COGEMA'S STAFF BELIEVES THAT MANY COST STUDIES WILL BE REQUIRED TO OPTIMIZE AND CHOOSE THE MOST SUITABLE COMPONENTS FOR INDUSTRIALIZATION OF THE NEW PROCESS.

4. FOLLOWING IS AN INFORMAL EMBASSY TRANSLATION OF A CEA PAPER WHICH, THE EMBASSY WAS TOLD, WAS TO BE THE BASIS OF CEA ADMINISTRATOR GIRAUD'S REMARKS IN SALZBURG. IN ADDITION, WIRE SERVICE REPORTS ON HIS SALZBURG STATEMENTS INDICATE THAT: A) HE IS INTERESTED IN BUILDING AS RAPIDLY AS PRACTICAL A DEMONSTRATION LIMITED OFFICIAL USE

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UNIT WITH A CAPACITY OF 50- TO 200,000 SWU. HE BELIEVES THIS PLANT COULD BE OPERATIONAL IN 1979 IF IT IS DECIDED ON THIS YEAR; B) INDUSTRIAL PLANTS WOULD NOT BE OPERATIONAL BEFORE END OF 1980S; C) CEA IS AWAITING INTERNATIONAL SUGGESTIONS AND PROPOSITIONS WHICH MIGHT BE MADE TO IT DURING THE COMING DAYS AND WEEKS.

5. BEGIN TRANSLATION.

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ACTION OES-07

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SP-02 SS-15 PA-01 PRS-01 MC-02 EB-07 TRSE-00  
USIA-06 FEA-01 ACDA-07 CIAE-00 INR-07 L-03  
NSAE-00 NRC-05 DODE-00 /106 W  
-----101033Z 111866 /16

P R 101005Z MAY 77  
FM AMEMBASSY PARIS  
TO SECSTATE WASHDC PRIORITY 2630  
INFO ERDA WASHDC PRIORITY  
ERDA GERMANTOWN MD PRIORITY  
AMEMBASSY OTTAWA  
AMEMBASSY TOKYO  
AMEMBASSY BONN  
AMEMBASSY BRUSSELS  
AMEMBASSY ROME  
USMISSION EC BRUSSELS  
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AMEMBASSY MADRID

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AFTER 1979 THE BASIS FOR THE FRENCH SUPPLY OF URANIUM ENRICHMENT SERVICES WILL BE THE EURODIF PLANT, WHOSE CONSTRUCTION IS PROCEEDING SATISFACTORILY, AND WHICH IS SCHEDULED TO START UP THAT YEAR. FROM THE MIDDLE OF THE NEXT DECADE ON, THERE ARE PLANS TO ADD CAPACITY TO THE COREDIF FIRM TO MEET THE NEEDS FOR THE DEVELOPMENT OF NUCLEAR PROGRAMS IN THIS PERIOD. THESE TWO ORGANIZATIONS WORK WITH BELGIAN, SPANISH, ITALIAN, AND IRANIAN PARTNERS. THEY WILL PROVIDE FOR AN IMPORTANT PART OF THESE COUNTRIES' URANIUM ENRICHMENT NEEDS UNDER CONDITIONS OF VIABILITY AND COMPETITION.  
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ALTHOUGH THESE ORGANIZATIONS PROVIDE SATISFACTORILY FOR THEIR MEMBERS' ENRICHMENT NEEDS, THERE IS ALSO AN INTEREST IN THE IMPROVEMENT OF NUCLEAR ENERGY TECHNOLOGY BY CREATING A URANIUM ENRICHMENT TECHNIQUE WHICH WOULD MAKE IT POSSIBLE BOTH TO PUT A MODEST AMOUNT OF CAPACITY IN PLACE UNDER ECONOMIC CONDITIONS, AND TO AVOID CONTRIBUTING TO THE

PROLIFERATION OF NUCLEAR WEAPONS.

IN A REVIEW OF DIFFERENT ENRICHMENT PROCEDURES WHICH FRENCH RESEARCHERS HAD BEEN STUDYING ON A FULL-TIME BASIS, IT BECAME CLEAR IN 1968 THAT THERE WAS SUCH A PROCESS, AND IT WAS ACTIVELY DEVELOPED BY RESEARCH TEAMS OF THE CEA. THIS WAS A CHEMICAL EXCHANGE SEPARATION PROCESS WHICH HAD SEVERAL INTRINSIC ADVANTAGES:

- A MODEST CONSUMPTION OF ENERGY
- RELATIVELY CONVENTIONAL TECHNOLOGY
- A GOOD CAPACITY TO EQUIP PLANTS DESIGNED FOR THE NEEDS OF LIMITED-SIZE MARKETS

IT IS KNOWN THAT CHEMICAL EXCHANGE PROCESSES ARE CHARACTERIZED IN GENERAL BY LOW ENRICHMENT COEFFICIENTS AND CONSIDERABLE IMMOBILIZATION OF URANIUM. THE VARIETY USED HERE BRINGS THESE PARAMETERS TO VALUES COMPATIBLE WITH AN OVERALL GOOD ECONOMIC OPERATION.

IN 1970 THE DECISION TO CONSTRUCT A SMALL PILOT PLANT WAS TAKEN. WHEN THE FEASIBILITY OF THE TECHNIQUE WAS ASSURED, TWO NEW PILOT PLANTS ON A LARGER SCALE WERE ESTABLISHED. IN 1975 AND 1976 THESE PILOT PLANTS OPERATED WITH AN AVAILABILITY SUPERIOR TO 90 PERCENT.

SINCE THEN NUMEROUS PILOTS OF COMPONENTS HAVE BEEN LIMITED OFFICIAL USE

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PLACED TO TEST VARIOUS APPROPRIATE TECHNOLOGIES.

SUBSTANTIAL FUNDS HAVE BEEN DEVOTED TO RESEARCH AND DEVELOPMENT ON THIS PROCESS.

SOME CHOICES HAVE BEEN MADE, AND THE CEA IS NOW PROCEEDING TO LAUNCH LOOPS TO TEST SOME OF THE ESSENTIAL COMPONENTS OF AN INDUSTRIAL FORM OF THIS PROCESS ON A FULL SCALE.

SOME TECHNICO-ECONOMIC STUDIES OF THE PRELIMINARY VARIETY HAVE SHOWN THAT IN CONSIDERING EXCLUSIVELY SOLUTIONS STUDIED UP TO NOW THIS PROCESS SHOULD BE COMPETITIVE WITH THE CONCURRENT SOLUTIONS FOR CAPACITIES LOWER THAN SOME MILLIONS OF SEPARATIVE WORK UNITS PER YEAR.

THE PROCESS IS SUSCEPTIBLE TO NUMEROUS VARIETIES AND IMPROVEMENTS WHICH HAVE NOT YET BEEN SYSTEMATICALLY STUDIED AND EXPLORED. THERE IS SOME HOPE THAT THE

PURSUIT OF RESEARCH WORK AND THE STUDY OF INDUSTRIAL  
DEVELOPMENT WILL MAKE IT POSSIBLE TO IMPROVE THE  
ECONOMICS OF ITS PERFORMANCE ON SOME SPECIFIC POINTS.

BUT THE MOST INTERESTING CHARACTERISTIC OF THIS PROCESS  
IS CERTAINLY THE PHYSICAL IMPOSSIBILITY OF PRODUCING  
HIGHLY ENRICHED URANIUM FROM IT. THIS IS DUE, AMONG  
OTHER REASONS, TO THE FACT THAT THERE IS NO  
POSSIBILITY OF REARRANGING THE CASCADE. IN ADDITION,

--THERE IS A LOW ENRICHMENT COEFFICIENT, BECAUSE OF THE  
RISKS OF CRITICALITY.

--AND, MOST IMPORTANTLY, THE TIME REQUIRED TO REACH  
EQUILIBRIUM FOR MILITARILY USEFUL ENRICHMENT OF  
URANIUM IS ABOUT ONE GENERATION (30 YEARS). IN  
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ACTION OES-07

INFO OCT-01 EUR-12 EA-07 IO-13 ISO-00 PM-04 NSC-05

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USIA-06 FEA-01 ACDA-07 CIAE-00 INR-07 L-03

NSAE-00 NRC-05 DODE-00 /106 W

-----101030Z 111777 /16

P R 101005Z MAY 77

FM AMEMBASSY PARIS

TO SECSTATE WASHDC PRIORITY 2631

INFO ERDA WASHDC PRIORITY

ERDA GERMANTOWN MD PRIORITY

AMEMBASSY OTTAWA

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CONTRAST, IT REQUIRES ONE TO TWO YEARS TO REACH  
THIS RESULT VIA THE GASEOUS DIFFUSION PROCESS AND  
ONE DAY VIA THE ULTRA-CENTRIFUGE PROCESS.

NO ONE WILL UNDERESTIMATE THE INTEREST THAT WILL BE  
ATTACHED TO THE FACT THAT THERE IS A VIABLE WAY TO  
SEPARATE INSTALLATIONS OF THE CIVIL NUCLEAR CYCLE  
FROM THOSE OF THE MILITARY NUCLEAR CYCLE. BECAUSE  
IF SUCH A SEPARATION COULD BE MADE, WE COULD EASILY  
RESOLVE FUNDAMENTAL PROBLEMS OF THE RISK OF NUCLEAR  
WEAPONS PROLIFERATION, WHICH TEND TO LEAD US TO  
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IMPOSE UNACCEPTABLE RESTRICTIONS ON TECHNOLOGY  
TRANSFERS.

THAT IS WHY THE FRENCH GOVERNMENT AUTHORIZED THE CEA  
TO MAKE CONTACTS AND TO ISSUE THE NECESSARY DATA FOR  
THE EXAMINATION OF THE CONDITIONS UNDER WHICH THIS  
PROCESS COULD BE THE SUBJECT OF INTERNATIONAL  
COOPERATION.

ON A TECHNICAL PLANE, THE CEA CONTEMPLATES UNDERTAKING  
THE CONSTRUCTION OF A FIRST ASSEMBLY LINE, WHICH WILL  
HAVE AS ITS PURPOSE AN INDUSTRIAL DEMONSTRATION OF  
THE PROCESS AND THE DEFINITION OF THE EXACT SPECIFICA-  
TIONS FOR FUTURE PLANTS.

THE PROBABLE RESULTS OF THIS PROCESS DO NOT ENTER INTO  
CONFLICT WITH EURODIF OR COREDIF BECAUSE THE LATTER  
TWO PROCESSES ARE NOT ON THE SAME SCALE OR ON THE  
SAME SCHEDULE.  
GAMMON

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## Message Attributes

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**Channel Indicators:** n/a  
**Current Classification:** UNCLASSIFIED  
**Concepts:** REPORTS, URANIUM, NUCLEAR ENERGY, PROGRAMS (PROJECTS), DEVELOPMENT PROGRAMS  
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**Copy:** SINGLE  
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**Decaption Date:** 01-Jan-1960 12:00:00 am  
**Decaption Note:**  
**Disposition Action:** RELEASED  
**Disposition Approved on Date:**  
**Disposition Case Number:** n/a  
**Disposition Comment:** 25 YEAR REVIEW  
**Disposition Date:** 22 May 2009  
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**Enclosure:** n/a  
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**Errors:** N/A  
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**Litigation History:**  
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**Office:** ACTION OES  
**Original Classification:** LIMITED OFFICIAL USE  
**Original Handling Restrictions:** n/a  
**Original Previous Classification:** n/a  
**Original Previous Handling Restrictions:** n/a  
**Page Count:** 6  
**Previous Channel Indicators:** n/a  
**Previous Classification:** LIMITED OFFICIAL USE  
**Previous Handling Restrictions:** n/a  
**Reference:** 77 PARIS 13433, 77 PARIS 13320  
**Retention:** 0  
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**Review Release Event:** n/a  
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**SAS ID:** 2582434  
**Secure:** OPEN  
**Status:** NATIVE  
**Subject:** NEWLY PROPOSED FRENCH ENRICHMENT SCHEME  
**TAGS:** TECH, ENRG, FR  
**To:** STATE  
**Type:** TE  
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**Review Markings:**  
Margaret P. Grafeld  
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